PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 0000055740	**FOR FURTHER ACTION** See Form PCT/IPEA/416	
International application No. PCT/EP2004/008136	International filing date *(day/month/year)* 21.07.2004	Priority date *(day/month/year)* 01.08.2003
International Patent Classification (IPC) or national classification and IPC C12N15/82, C07K14/395, C12N5/10, G01N33/50, C07K16/14, A01H5/00		
Applicant BASF PLANT SCIENCE GMBH et al.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 10 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☐ *sent to the applicant and to the International Bureau)* a total of sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the opinion
☐	Box No. II	Priority
☒	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☒	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☒	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
09.07.2005	02.09.2005
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Burkhardt, P Telephone No. +49 89 2399- 7456

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/008136

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3 and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4)
   - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-197 as originally filed

Sequence listings part of the description, Pages

1-290 as originally filed

Claims, Numbers

1-26 as originally filed

Drawings, Sheets

1/3-3/3 as originally filed

☒ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 25 (partially)

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the said claims Nos. 25 (partially)

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form	☐	has not been furnished
	☐	does not comply with the standard
the computer readable form	☐	has not been furnished
	☐	does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☐ See separate sheet for further details

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation to restrict or pay additional fees, the applicant has:
   - ☐ restricted the claims.
   - ☐ paid additional fees.
   - ☐ paid additional fees under protest.
   - ☒ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

   ☐ complied with.

   ☒ not complied with for the following reasons:

   see separate sheet

4. Consequently, this report has been established in respect of the following parts of the international application:

   ☐ all parts.

   ☒ the parts relating to claims Nos. 1-25 (all partially) .

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-5
	No:	Claims	7 -25
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-25
Industrial applicability (IA)	Yes:	Claims	1-25
	No:	Claims	

2. Citations and explanations (Rule 70.7):

   see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Supplemental Box relating to Sequence Listing

Continuation of Box I, item 2:

1. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this report has been established on the basis of:

   a. type of material:

   ☒ a sequence listing

   ☐ table(s) related to the sequence listing

   b. format of material:

   ☒ in written format

   ☒ in computer readable form

   c. time of filing/furnishing:

   ☒ contained in the international application as filed

   ☒ filed together with the international application in computer readable form

   ☐ furnished subsequently to this Authority for the purposes of search and/or examination

   ☐ received by this Authority as an amendment on

2. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

3. Additional observations, if necessary:

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. Present claim 25 relates to a composition comprising a product defined by reference to a desirable characteristic or property, namely to act as an agonist or antagonist of the protein as defined by SEQ ID NO:2.

2. The application does not provide support within the meaning of Article 6 PCT nor disclosure within the meaning of Article 5 PCT for such a product. In the present case, the claim so lacks support, and the application so lacks disclosure, that a meaningful examination is impossible.

3. Independent of the above reasoning, the claim also lacks clarity (Article 6 PCT). An attempt is made to define a product within a process by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful examination impossible.

4. The examination has therefore been limited to those parts of the claim that appear to disclosed and supported, namely those parts relating to all other products comprised in the composition of claim 25 except the agonists and antagonists.

Re Item IV

Lack of unity of invention

1. Article 3(4)iii PCT and Rule 13.2 PCT stipulate that where a group of inventions is claimed the requirements of unity shall be fulfilled only where there is a technical relationship among those inventions involving one or more of the same corresponding special technical features. "Special" technical features are those features that define a contribution which each of the inventions makes over the prior art.

2. The only corresponding technical feature linking the different groups of inventions is that they all relate to genes encoding proteins that are supposed to be involved in the synthesis of so-called "fine chemicals". Such

genes were already known form the prior art (e.g.WO-0144276, WO-0100804,WO-03040293 or WO-0159128) Therefore, this feature cannot provide a common inventive concept for inventions 1 - 205.

3. Consequently, there is lack of unity, and the different inventions not belonging to a common inventive concept, have been divided into different groups pursuant to Article 17(3)(a) PCT.

Invention 1: Claims 1-26 (all partially),
relating to an isolated nucleic acid sequence (SEQ ID NO:1), the corresponding amino acid sequence (SEQ ID NO:2) and methods and products comprising said sequences.

Inventions 2-193: Claims 1-26 (all partially),
as invention 1 but relating to the isolated nucleic acid sequences with SEQ ID NOs:3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201 ,203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393 and the corresponding amino acid sequences with SEQ ID NOs:4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 220, 222, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350,

352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386. 388, 390, 392, 394

Invention 194: Claims 2-26 (all partially),
relating to an amino acid sequence comprising the sequence motif as displayed in SEQ ID NO:47, nucleic acid sequence encoding said amino acid and methods and products comprising said sequences.

Inventions 195-203: Claims 2-26 (all partially),
as invention 194 but relating to amino acid sequences comprising the sequence motifs as displayed in SEQ ID NOs:48, 49, 50, 51, 52, 397, 398, 399, 400.

Invention 204: Claims 2-26 (all partially),
relating to nucleic acid molecules amplified from a library using the primers in SEQ ID NO:53 and methods and products comprising said sequence.

Invention 205: Claims 2-26 (all partially),
relating to nucleic acid molecules amplified from a library using the primers in SEQ ID NO:54 and methods and products comprising said sequence.

4. Applicant chose not to pay additional search fees. This opinion is therefore limited to invention 1 (SEQ ID NOs:1 and 2), referring to a ras-related RHO2 gene from *Saccharomyces cerevisiae*.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Article 33(2)(3) PCT (Novelty and inventive step)

1. 1. The following documents (D) are referred to; the numbering is following the order of the International Search Report:

D1 Madaule *et al.*, 1987. PNAS 84:119-783
D2 WO-0159128 (BASF AG)
D3 WO-0144276 (BASF Plant Science)

D4 WO-0100804 (BASF AG)
D5 WO-03040293 (BASF AG)

1. 2. Present claim 6 is directed to a nucleic acid molecule as depicted in SEQ ID NO:1. Document D1 discloses a sequence that shows 100% identity to SEQ ID NO:1 and thus anticipates the subject-matter of claim 1. The same holds true for dependent claims 7 - 16. They do all not meet the requirements of Article 33(2) PCT.

1. 3. Present claims 17 - 25 do not contain any features that would render them novel and/or inventive over the prior art. Claims 17 - 25 do not meet the requirements of Article 33(2)(3) PCT.

1. 4. Even if one were to accept applicant's definition to establish novelty over the prior art (see Item VIII, paragraph 1), claim 6 still would not meet the requirements of Article 33(3) PCT. No inventive activity can be seen in the provision of nucleotide sequences that are distinguished from the prior art by only 1 nucleotide. Various techniques for obtaining such sequences were available at the filing dat of the present application and would have been used by the man skilled in the art according to his needs.

1. 5. The application does not provide credible evidence that overexpression of SEQ ID NO:1 or a of a sequence encoding SEQ ID NO:2 would solve the technical problem, namely the provision of a process for the production of a(ny) so-called fine chemical in a(ny) non-human organism.

1. 6. The ISA is therefore of the opinion that present claim 1 does not solve the technical problem and hence not meet the requirements of Article 33(3) PCT. The same holds true for present claim 2 and for dependent claims 2 - 5

Re Item VIII
Certain observations on the international application

1. Present claim 6 defines the claimed subject-matter by negative features, i.e. "... whereby the nucleic acid molecule distinguishes over the sequence as depicted in SEQ ID NO:1 by one or more nucleotides.". This renders the claim unclear (Article 6 PCT) as it excludes what the applicant did not invent rather than clearly and concisely reciting what he did invent (PCT Guidelines 5.42). Moreover an undue burden is placed on others trying to establish the extent of protection (Article 5 PCT).

2. Claims 2 and 6 have been drafted to contain separate independent technical features (in total **9** different features). They appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness (Article 6). Moreover, lack of clarity of the claims as a whole arises, since the plurality of independent features makes it difficult, if not impossible, to determine the matter for which protection is sought, and places an undue burden on others seeking to establish the extent of the protection (Article 5 PCT).

3. Present claims 2 f), 2 l), 6f) and 6i) do not meet the requirements of Article 5 PCT. It would require undue experimentation to test all the nucleic acid molecules that are **obtainable** from **suitable** libraries with the claimed primers or probes.

4. Present claims 2c) and 6c) are unclear (Article 6 PCT). The nature of the nucleic acid molecules whose sequence can be deduced from the polypeptides encoded by a nucleic acid molecule of claims 2a) or 2b) and 6a) or 6b) cannot be easily determined. The claim in its present form furthermore reads on to structurally unrelated compounds that are not sufficiently disclosed (Article 5 PCT) as the only further characterising feature "conferring an in crease in the amount of fine chemical in an organism" in itself is vague and unclear.